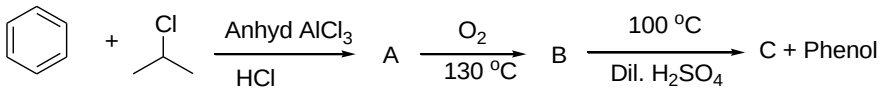
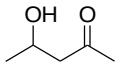
Green Chemistry

1. Which one of the following is not formed when a mixture of methyl bromide and bromobenzene is heated with sodium metal in the presence of dry ether?
   a. Ethane c. propane
   b. Biphenyl d. Toluene
2. An organic compound ‘A’ burns with a sooty flame. It is negative towards a Tollen’s reagent test and positive for Borsche’s reagent test. The compound ‘A’ is
   a. Benzaldehyde c. Acetone
   b. Acetophenone d. Salicylic acid
3. Identify ‘C’ in the following



   a. Water c. Cumene hydroperoxide
   b. Propanone d. Ethanol
4. The IUPAC name  of

   a. 4-hydroxy-2-penanone c. 2-oxo-4-pentanol
   b. 2-hydroxy-4-pentanone d. 4-keto-2-pentanol
5. When formic acid is heated with concentrated H_2SO_4, the gas evolved is
   a. Only ‘CO_2’ c. A mixture of ‘CO’ & ‘CO_2’
   b. Only CO d. A mixture of ‘SO_2’ &’ CO_2’
6. Which of the followings pairs are correctly matched

	Reactant	Product
A.	RX+ Ag(OH) aq	RH
B.	RX+AgCN(alc)	RNC
C.	RX=KCN (alc)	RNC
D.	RX+Na (ether)	R-R

   a. A alone b. A&B c. A&B d. A&D

7. The pH of the 10^{-8} M HCl solution is

   a. 8 c. more than 8

   b. 6.9586 d. slightly more than 7

8. Which of the following is NOT a colligative property?

   a. Elevation in boiling point b. Depression in freezing point

   c. Osmotic pressure d. Lowering of vapour pressure.

9. 3g of urea is dissolved in 4.5 g of H_2O. The relative lowering in vapour pressure is
   a. 0.05
   b. 0.04
   c. 0.02
   d. 0.01

10. The process is spontaneous at the given temperature if,
   a. ΔH is +ve & ΔS is –ve
   b. ΔH is –ve & ΔS is +ve
   c. ΔH is +ve & ΔS is +ve
   d. ΔH is +ve & ΔS is equal to zero.

11. MnO_2+ HCl $\xrightarrow{\text{heat}}$ A (g)

   A (g) + E_2 (excess) $\xrightarrow{573K}$ B (g)

   B (g) + U(s) $\longrightarrow$ C (g) + D(g)

   The gases A, B, C & D are respectively

   a. Cl_2,ClF, UF_6, ClF_3
   b. Cl_2,ClF_3, UF_6, ClF
   c. O_2, OF_2, U_2O_3,O_2F_3
   d. O_2, , O_2F_2, , U_2O_3, O_2F_3

12. 5.5 mg of nitrogen gas dissolved in 180g of water at 273K and 1atm pressure due to nitrogen gas. The mole fraction of nitrogen in 180g of water at 5atm nitrogen pressure is approximately

a. 1 X 10^{-6} b. 1 X 10^{-5} c. 1 X 10^{-3} d.1 X 10^{-4}

13. A crystalline solid X reacts with dil. HCl to liberate a gas Y. Y decolourises acidified $KMnO_4$. When a gas 2 is slowly passed into an aqueous solution of Y, colloidal sulphur is obtained. X & Z could be, respectively

a. Na_2S, SO_3 c. Na_2SO_3, H_2S

b. Na_2SO_4, H_2S d. Na_2SO_4, SO_2

14. A solution of 1.25g of P in 50g of water lowers freezing point by 0.3°C. Molar mass of P is 94. K_f(water)=1.86K kg mol^{-1}. The degree of association of P in water is

a. 80% b. 60% c. 65% d. 75%

15. For $Cr_2O_7^{2-} + 14H^+ + 6e^- \longrightarrow 2Cr^{3+} + 7H_2O$

E^o=1.33 V at [$Cr_2O_7^{2-}$] = 4.5 millimole, [Cr^{3+}]=15 millimole , E is 1.067V.

The pH of the solution is nearly equal to

a. 2 b. 3 c. 5 d.4

16. 50 g of $CaCO_3$ in a 10 litre closed vessel is heated to 1000K. Percentage of $CaCO_3$ that remains unreacted at equilibrium is (Given: R= 0.082L at mK^{-1} mol^{-1})

a. 40 b. 50 c. 60 d. 20

17. Gold Sol is not

a. A macromolecular colloid

b. A lyophobic colloid

c. A multimolecular colloid

d. Negatively charged colloid

18. For an ideal binary liquid mixture,

a. ΔS (mix) =0; ΔG (mix) =0

b. ΔH (mix) =0; ΔS (mix) <0

c. ΔV (mix) =0; ΔG (mix)>0

d. ΔS (mix)>0; ΔG (mix) <0

19. For hydrogen-oxygen fuel cell at 1 atm and 298 K

$H_2(g) + \frac{1}{2} O_2(g) \longrightarrow H_2O(L)$; ΔG^o = -240 KJ, E^o for the cell is approximately,

(Given; F=96500 C)

a. 2.48 V b. 1.24V c. 2.5V d. 1.26V

20. 0.30g of an organic compound containing C H & O on combustion yield 0.44g CO_2 & & 0.18g H_2O. If one mol of compound weighs 60, then molecular formula of the compound is

a. C_3H_8O b. $C_2H_4O_2$ c. CH_2O d. C_4H_6O

21. 100cm^3 of 1M CH_3COOH was mixed with 100cm^3 of 2M CH_3OH to form an ester. The change is the initial rate if each solution is diluted with equal volume of water would be

a. 4 times b. 2 times c. 0.25 times d. 0.5 times

22. The complex ion having minimum magnetic of Δ_0 (CFSE) is

a. $[Co(NH_3)_6]^{3+}$ b. $[Cr(H_2O)_6]^{3+}$ c. $[Cr(en)_6]^{3-}$ d. $[CoCl_6]^{3-}$

23. In the reaction

$S + 3/2\ O_2 \longrightarrow SO_3 + 2x$ kJ and

$SO_2 + \frac{1}{2} O_2 \longrightarrow SO_3 + Y$ kJ

Heat of formation of SO_2 is

a. x-y b. 2x+y c. x+y d. 2x-y

24. Which of the following compounds possesses the"C-H" bond with the lowest bond dissociation energy?

a. Benzene b. 2, 2- Dimethyl propane c. Toluene d. n-Pentane

25. Orlon has monomeric unit

a. Glycol b. Isopropene c. Acrolein d. Vinyl cyanide

26. H_2O_2 cannot oxidise

a. Na_2SO_3 b. KI c. PbS d. O_3

27. In H_2-O_2 fuel cell the reaction occurring at cathode is

a. $O_2(g) + 2H_2O(l) + 4e^- \longrightarrow 4OH^-_{(aq)}$

b. $H^+_{(aq)} + OH^-_{(aq)} \longrightarrow H_2O_{(l)}$

c. $2H_{2(g)} + O_{2(g)} \longrightarrow 2H_2O_{(l)}$

d. $H^+ + e^- \longrightarrow \frac{1}{2} H_2$

28. Glycogen is

a. A structure polysaccharide

b. structurally similar to amylopectin but extensively branched

c. A polymer of β-D-glucose units

d. Structurally very much similar the amylopectin

29. Which of the following reactions will not give a primary amine

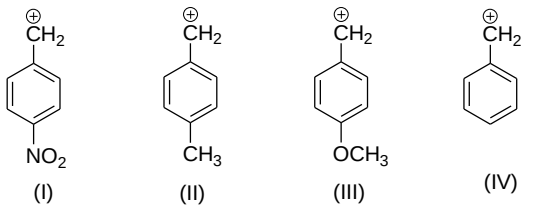
a. $CH_3CH_2CONH_2 \xrightarrow{Br_2/NaOH}$

b. $CH_3CH_2NC \xrightarrow{LiAlH_4/\ Ether}$

c. $CH_3CH_2CN \xrightarrow{LiAlH_4/\ Ether}$

d. $CH_3CH_2CONH_2 \xrightarrow{LiAlH_4/\ Ether}$

30. The order of stability of the following carbocations is



(I) (II) (III) (IV)

a. I > II > III > IV b. III > II > IV > I

c. IV > III > II > I d. III > II > I > IV

31. Which of the following arrangements represent increasing oxidation number of the centre atom?

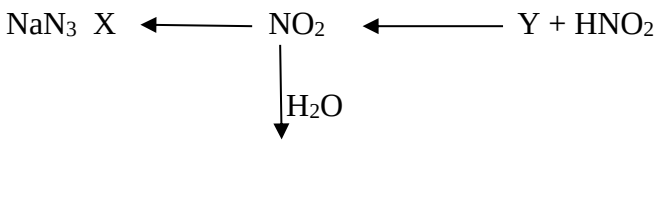
a. CrO_2^-, CrO_3^-, CrO_4^{2-}, MnO_4^-.

b. ClO_3^-, CrO_4^{2-}, MnO_4^-, CrO_2^-,

c. CrO_2^-, ClO_3^-, MnO_4^-, CrO_4^{2-},

d. CrO_4^{2-}, MnO_4^-, CrO_2^-, ClO_3^-,

32. Identify X,Y & Z in the following reactions



a. NaOH, NH_4OH, HNO_2

b. $NaNH_2$, NH_2OH, $H_2N_2O_2$

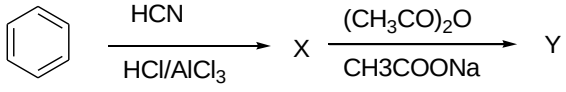
c. NaOH , NH_2OH, HNO_2

d. $NaNH_2$ NH_4OH, $H_2N_2O_2$

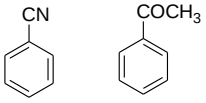
33. An organic compound 'X' having molecular formula C_2H_3N on reduction gave another compound 'Y', upon treated with nitrous acid, 'Y' gave ethyl alcohol. On worming with chloroform & alcoholic KOH, 'Y' formed an offensive smelling compound 'Z'. The compound 'Z' is

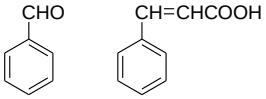
(a) $CH_3CH_2NH_2$ (b) $CH_3CH_2N \rightleftharpoons C$

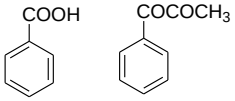
(c) $CH_3C{\equiv}N$ (d) CH_3CH_2OH

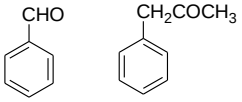
34. 

X and Y are respectively

a) 

b) 

c) 

d) 

35. The correct order of solubility of the sulphate alkaline earth metals in water is

a. Be>Ca> Mg> Ba> Sr

b. Mg >Be>Ba>Ca>Sr

c. Be>Mg>Ca>Sr>Ba

d. Mg>Ca>Ba>Be>Sr

36. Compound (A) $C_5H_{10}O$ forms a phenyl hydrazone and gives negative tollen's and iodoform test. If on reduction gives n-pentane compound (A) is

a. Pentanal b. Pentan-2-one

c. Pentan-3-one d. Amyl alcohol

37. p- chloroaniline and anilinium hydrochloride can be distinguished by;

a. Sandmeyer reaction b. $NaHCO_3$

c. $AgNO_3$ d. Carbylamine test

38. A new carbon-carbon bond formation is possible in;

a. cannizzaro reaction

b. Friedel-crafts alkylation

c. Celmmensen reduction

d. Reimer- Tiemann reaction

39. Which of the following compounds will show geometrical isomerism;

a. 2- butene

b. Propene

c. 1-phenylpropene

d. 2-methyl-2-butene

40. For a first order reaction;

a. The degree of dissociation equal to $(1-e^{-kt})$

b. A plot of reciprocal concentration of the reactant v/s time gives a straight line.

c. The time taken for completion of 75% reaction is thrice the $t_{1/2}$ of the reaction.

d. The pre-exponential factor in the Arrhenius equation has the dimension of time T^{-1}

41. In the commercial electrochemical process for aluminium extraction the electrolyte used is

a. $Al(OH)_3$ in NaOH solution

b. An aqueous solution of $Al_2(SO_4)_3$

c. An molten mixture of Al_2O_3 , & Na_3AlF_6

d. A molten mixture of AlO(OH) & $Al(OH)_3$

42. The optically active tartaric acid is named as D-(+)-tartaric acid because it has a positive;

a. Optical rotation & is derived from D-glucose

b. pH in organic solvent

c. Optical rotation & is derived from D-(+)-glyceraldehyde

d. Optical rotation only when substituted by deuterium.

43. The product (S) obtained in a oxymercuration ($HgSO_4+H_2SO_4$) of 1-butyne would be.

a. $CH_3CH_2COCH_3$

b. $CH_3CH_2\ CH_2$-CHO

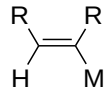
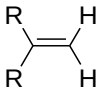
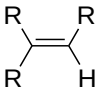
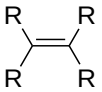
c. CH_3CH_2CHO + HCHO

d. $CH_2\ CH_2COOH$+HCOOH

44. The number of P-O-P bonds in cyclic metaphosphoric acid is

a. Zero b. Two c. Three d. four

45. Which one of the following alkenes will react faster with H_2 under catalytic hydrogenation condition

(a)  (b)  (c)  (d) 

46. Which of the following compound will exhibit geometrical isomerism;

a. 1-phenyl-2-butene c. 2-phenyl-1-butene

b. 3-phenyl-1-butene d. 1,1-diphenyl-1-propene

47. The rms velocity of hydrogen is $\sqrt{7}$ times the rms velocity of nitrogen. If T is the temperature of the gas

a. $T(H_2) = T(N_2)$ c. $T(H_2) < T(N_2)$

c. $T(H_2) > T(N_2)$ d. $T(H_2) = \sqrt{7}\, T(N_2)$

48. At 100^oC and 1atm if the density of the liquid water is 1.0 g cm^{-3} and that of water vapour is 0.0006 cm^{-3}, then the volume occupied by water molecules in 1 litre of steam at this temperature is;

a. 6 cm^3 b. 60 cm^3 c. 0.6 cm^3 d. 0.06 cm^3

49. In thermodynamics a process is called reversible when

a. Surroundings and system change into each other

b. There is no boundary between system and surroundings

c. The surroundings are always in equilibrium with the system

d. The system changes into the surroundings spontaneously.

50. The Quantum numbers +1/2 & -1/2 for the electron spin represent

a. Rotation of the electron in clockwise and anticlockwise direction respectively

b. Rotation of the electron in anticlockwise and clockwise direction respectively

c. Magnetic moment of the electron pointing up and down respectively

d. Two quantum mechanical spin which have no classical analogue

51. If 'I' is the intensity of absorbed light & 'C' is the concentration of AB for the photochemical process AB+ h□ AB· , The rate of formation of AB* is directly proportional to;

a. C b. I c. I^2 d. C.I

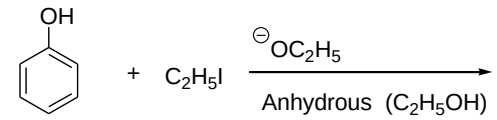
52. Rate of physiorption increases with;

a. Decrease in temperature

b. Increase in temperature

c. Decrease in pressure

d. Decrease in surface area.

53. 

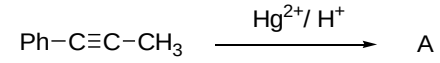
a. $C_6H_5O\ C_2H_5$ b. $C_2H_5O\ C_2H_5$

c. $C_6H_5\ OC_6H_5$ d. C_6H_5I

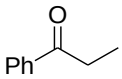
54. In a first order reaction the concentration of reactant decreases from 800mol/dm^3 to 50 mol/dm^3 in 2 X10^4 sec. The rate constant of reaction in sec^{-1} is

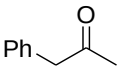
a. 2 X 10^4 b. 3.45 X 10^{-5}

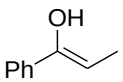
c. 1.386 X 10^{-4} d. 2 X 10^{-4}

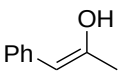
55. 

A is

(a) 

(b) 

(c) 

(d) 

56. Mixture X=0.02mol of $[Co(NH_3)_5SO_4]Br$ and 0.02 mol of $[Co(NH_3)_5Br]SO_4$ was prepared in 2 litre of solution

1 litre of mixture X + excess $AgNO_3$ ⟶ Y

1 litre of mixture X + excess $BaCl_2$ ⟶ Z

Number of moles of Y & Z is

a. 0.01, 0.01 b. 0.02, 0.01

c. 0.01, 0.02 d. 0.02, 0.02

57. $(Me)_2SiCl_2$ on hydrolysis will produce

a. $(Me)_2Si(OH)_2$ b.$(Me)_2Si=O$

c. $-[-O-(Me)_2Si-O-]_n-$ d. $(Me)_2SiCl(OH)$

58. An enantiomerically pure acid is treated with racemic mixture of an alcohol having one chiral carbon. The ester formed will be

a. Optically active mixture

b. Pure enantiomer

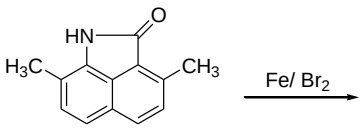
c. Meso compound

d. Racemic mixture

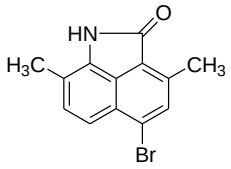
59. Benzamide on treatment with $POCl_3$ gives

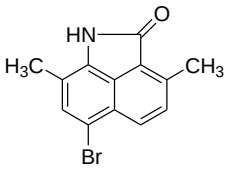
a. Aniline b. Benzonitrile

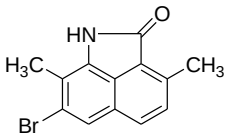
c. chlorobenzene d. benzylamine

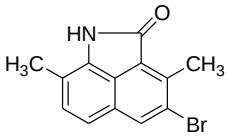
60. 

Product on monobromination of this compound is

(a) 

(b) 

(c) 

(d) 

Green Answers

1	c
2	b
3	c
4	a
5	b
6	d
7	b
8	d
9	c
10	b
11	b
12	c
13	c
14	a
15	a
16	c
17	a
18	d
19	b
20	b
21	b
22	d
23	None
24	c
25	d

26	d
45	a
46	a
47	c
48	c
49	c
50	d
51	d
52	a
53	b
54	c
55	a
56	a
57	c
58	a
59	b
60	b